Badlands Fossil News

Grades: 3 and 4
Length: 30 minutes

South Dakota Content Standards

♦ 3rd Grade Life Science: Students will describe how species depend on one another and on the environment for survival.
♦ 3rdGrade Life Science: Students will explain reasons for the extinction of species.

♦ 4th Grade Life Science: Students will examine how the fossil record, which has occurred over time, provides evidence of change in organisms.
♦ 4th Grade Life Science: Students will describe behavioral and structural adaptations plants and animals have to survive in a given environment.

Primary Theme

The Badlands fossil and geological record reflects changing climates and the diversity of life; its study provides insight into the survival of species.

Objectives

List three prehistoric animals, besides dinosaurs.

Describe two differences between modern and prehistoric horses.

Discuss that the fossilized mammals found in Badlands National Park lived **after** the dinosaurs went extinct.

Materials

♦ "Badlands Fossil Story News" article (page 33 in this packet)

Background

This lesson introduces students to prehistoric animals of Badlands National Park. No dinosaurs roamed here! At the time of the dinosuars, this region was under water. The sea retreated, dinosaurs went extinct, and a diverse variety of prehistoric MAMMALS roamed the land. The attached article highlights some of the more common fossils found within the White River Badlands of South Dakota. Also, it highlights some of the major climate and environmental changes that occurred. Please prepare your students for the *Time Travel lesson* by reading and discussing the article.

Procedure

1. Hand out a copy of the article to every student.

2. Ask the students to read the article OR read it aloud to them.

3. Lead a discussion about the article.

4. Ask the students to write down any questions they may have about the article or prehistoric mammal life for the following lessons.

Resources

Dickinson, Alice. "The First Book of Prehistoric Animals." Franklin Watts, Inc. 1954.

Duggleby, John. "The Sabertooth Cat." Macmillan Publishing Company, 1989. ISBN 0-89686-462-6.

National Geographic Society. "Giants From the Past." 1983. ISBN 0-87044-424-7.

Additional Information

National Park Service - www.nps.gov
Information on all of America's National Parks. Includes a special section for students and teachers.

Views of the National Parks - www2.nature.nps.gov/views
Virtual experiences of national parks and knowledge centers on various natural resource themes.

National Park Service Web Rangers - www.nps.gov/webrangers
Kids can become Junior Rangers from their home or school.

Badlands Fossil Story News

Pre-Historic Life Besides Dinosaurs?!

Millions of years ago, the land you live on did not look like it does today. There were no humans living then, and even the environment looked different. During the time of the dinosaurs, most of what is now South Dakota was covered by a great inland sea. Eventually the waters of the sea drained away and animals started to move into the area. What sorts of animals do you think lived in this area of South Dakota? Let's explore some of the different types of animals who's fossils we find at Badlands National Park!

THE LARGE MAMMALS ARRIVE

Dinosaurs disappeared 65 million years ago, and an amazing variety of mammals appeared in their place. The areas where dinosaurs had lived gradually changed, and so did the kinds of animals that lived there. Swampy lowlands became grassy highlands. In time, huge herds of giant four-legged animals grazed. Saber-toothed cats hunted the grazers. After millions of years, the parade of giant beasts gradually ended. Perhaps the climate became too cold. Perhaps food became scarce. Perhaps too many animals crowded certain areas. Perhaps

humans hunted some mammals into extinction. Scientists are not certain why so many of the giant mammals disappeared. But by the time humans had settled much of the world, 10,000 years ago, almost all the giants were gone.

A BIG PIG

The prehistoric piglike animals on this page grew as big as cows. They lived in North America and Asia between 40 million and 15 million years ago. "They were not the cuddly, three-little-pigs kind of animal you see today," says Dr. Michael R. Voorhies. "They had big heads and long legs, and they were not really pigs."

They looked so much like pigs, however, that the name for one of them is *Dinohyus* (die-nuh-HIGH-us). This means "powerful pig." *Dinohyus* could run fast, but did not depend on speed to attack its prey. In fact, it probably ate the meat of dead animals, rather than killing live prey. It also ate nuts and fruit. "It probably used its long legs to get from one feeding spot to another," says Dr. Voorhies. "It had to cover a lot of ground."

"The large head of *Dinohyus* and its relatives contained a good-size brain. The powerful pig was not as clever as a monkey, but its brain was good enough to keep it going for 25 million years. *Dinohyus* was the last and largest of the giant pigs." Today's pigs, even the wild boars of Europe and Asia, are only distantly related to the early giants. Wild boars found in scattered places in the United States are descended from animals brought to North America from Europe.

HORSES HOW SMALL??

At the dawning of the Age of Mammals, a small horselike animal lived in North America. It was only a foot tall, about the size of a fox terrier. It was so small that one of its enemies might have been a giant bird. The little horselike mammal had four toes on its wide front feet and three toes on its back feet. It padded along the soft ground. North America was warmer then. Forests covered most of the land. Grass was just beginning to appear. The little animal ate leaves from shrubs and small trees. It had a short snout shaped somewhat like that of a dog.

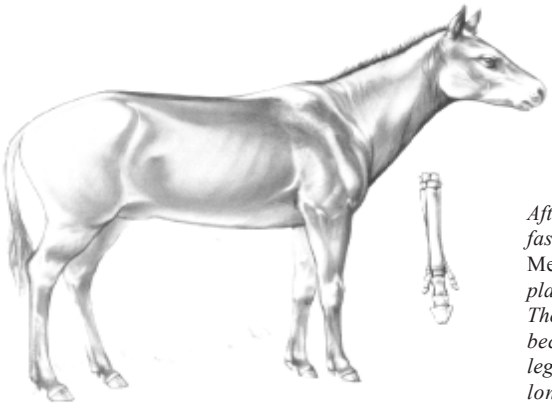
Some scientists call this first known horselike animal ***Hyracotherium*** (hy-rack-uh-THIH- ree-um). Others call it ***Eohippus*** (ee-uh-HIP-us) which means "dawn horse." Herds of ***Eohippus*** probably browsed on gentle slopes where the Rocky Mountains were beginning to rise.

Fossils of this horse have been found in the Rockies, Badlands National Park and in many other places. The fossils help scientists picture how ***Eohippus*** looked. Over many millions of years, the ancient horses gradually changed, becoming larger and more like the horses of today.

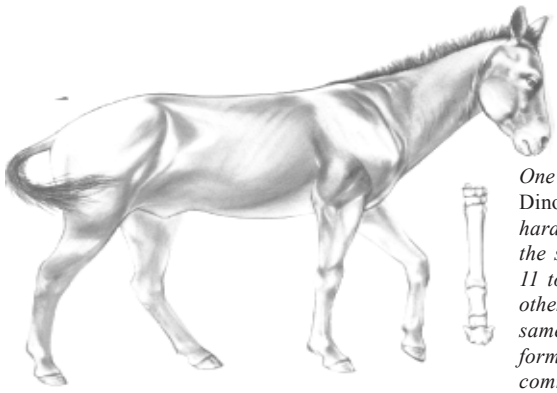
Information adapted from "Giants from the Past." Books for World Explorers, National Geographic Society. 1983.

Forest-dwelling Eohippus *stood only 12 inches tall. It was the first known ancestor of today's horse. The small mammal had four toes on its front feet and three on it back feet. Eohippus lived about 55-51 million years ago.*

An ancient horse named Mesohippus *lived fromabout 38 million to 26 million years ago. Ift grazed in open areas. This horse stood about 2 feet tall at the shoulder. It had only three toes on its front feet. Side toes were not used in running on the hard, grass-covered land where* Mesohippus *lived. It could run faster and farther without the little side toes* Eohippus *had. Hard running had become the horse's way of life.*



After still another 20 million years, a faster running horse called Merychippus *appeared on the plains. It used only its middle toe. The other two toes on each front foot became smaller and smaller. The legs of the horse gradually became longer*



One of the first one-toed horses, Dinohippus *ran especially well on hard ground. It stood 47 inches at the shoulder.* Dinohippus *lived from 11 to 2 million years ago. Many other kinds of horses lived at teh same time. Scientists think some form of* Dinohippus *was the common ancestor of today's horses, zebras, and donkeys.*